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OIL POLLUTION PREVENTION AND RESPONSE

SPCC Requirements and Pollution Prevention Practices for Mines and Quarries

Compliance Assistance Guide

United States Environmental Protection Agency • 1999

About the Compliance Assistance Guides...

The U.S. Environmental Protection Agency (EPA) has prepared this series of guides for owners and operators of oil facilities to help you better understand the Federal Oil Pollution Prevention regulation. This regulation has two sets of requirements — the Spill Prevention Control and Countermeasure (SPCC) plan rule (an oil spill *prevention* program), and the Facility Response Plan (FRP) rule (an oil spill *response* program). You *must* comply with these requirements if you meet the applicability provisions set out in each rule. You can find the Federal Oil Pollution Prevention regulation in Title 40 of the Code of Federal Regulations (CFR) part 112 (40 CFR part 112). The CFR is available at Federal Depository Libraries around the country, many of which are on the campuses of major colleges and universities. The CFR is also available online at **http://www.gpo.gov**. Be aware that the series is *guidance* only; you should review the regulation if you think it applies to you.[1] A complete list of Oil Spill Program outreach guides and information on obtaining them appears in the "Compliance Assistance Guides" section at the end of this document. Or you may find the series at EPA's Oil Spill Program Website at **http://www.epa.gov/oilspill**.

[1] This guidance is based on the existing SPCC/FRP rule and policies in effect on December 31, 1998. This guidance may change as the SPCC rule is revised.

What Will I Find in this Guide?

This guide, *SPCC Requirements and Pollution Prevention Practices for Mines and Quarries*[2]-

- ◆ Describes the equipment and operations a mine or quarry owner or operator needs to address to prepare and implement a satisfactory SPCC Plan;
- ◆ Recommends practices for preventing pollution and discharges* of oil; and
- ◆ Briefly discusses FRP applicability.

Before reading this guide, you should read the *Introduction and Background to the Oil Pollution Prevention Regulation* in the Compliance Assistance Guides.
*You can find the definition of "discharge" in 40 CFR 112.2.

What Kind of Facility is SPCC-Regulated?

You *must* comply with EPA's SPCC requirements (40 CFR 112.1 through 112.7) if both of the following conditions describe your facility operations. The first is that you own or operate a non-transportation-related fixed facility that could reasonably be expected to discharge oil into or upon the navigable waters of the United States or adjoining shorelines. The second is that your facility has (1) an aboveground oil storage capacity of more than **660** gallons in a single container; or (2) a total aboveground oil storage capacity of more than **1,320** gallons; or (3) a total underground buried storage capacity of more than **42,000** gallons. SPCC applicability is dependant on the tanks maximum design storage volume and not "safe" operating or lesser operational volume.

When determining if you are subject to SPCC requirements, consider *all* tanks, drums, equipment capacity, and electrical transformers. For example, a surface mine or quarry with a 20,000-gallon underground tank; ten 55-gallon drums of various oils; 15 trucks each with an oil capacity of 40 gallons; a service truck with a 150-gallon tank; and five transformers each with an 8-gallon capacity must comply because the facility would have an aboveground capacity of 1,340 gallons (550 gallons in drums, 600 gallons in equipment, 150 gallons on the service truck, and 40 gallons in the transformers). Underground mine oil capacity is considered aboveground if a spill could potentially reach the surface.

Your facility may not be regulated if, due to its location, it could not reasonably be expected to discharge oil into navigable waters of the U.S. or the adjoining shorelines.

The mining and quarrying sector consists of all facilities that remove natural resources, other than oil and gas, from the earth's crust. This includes underground and surface metal and nonmetal mines, coal mines, rock quarries, and sand and gravel pits. Many mines and quarries consume large quantities of oil in their operations, and use several types of diesel powered equipment. Therefore, these facilities store a large quantity of oil.

A typical underground mine has a mine opening, vertical or shaft openings and horizontal adits, a processing plant for concentrating ore, and associated buildings (e.g., offices, shops, a change house, and a compressor building). A typical surface mine has a mine or pit, a processing plant for concentrating the ore, and associated buildings (e.g., offices, shops, a change house, and a compressor building). Shops at surface mines tend to be larger than those at underground mines because of the amount of mobile equipment that is used.

The SPCC Plan *Must:*

- ◆ Be kept onsite.
- ◆ Be certified by a Registered Professional Engineer (PE).
- ◆ Have full management approval.
- ◆ Conform with all SPCC requirements in 40 CFR part 112.
- ◆ Discuss spill history.
- ◆ Discuss spill prediction (i.e., direction of flow).
- ◆ Be reviewed every three years by management.
- ◆ Be amended when you change the facility and recertified by a PE.

What Do I Need to Do?

In General

If you are the owner or operator of an SPCC regulated mine or quarry, you *must* have a written site-specific spill prevention plan, which details your facility's compliance with 40 CFR part 112. Requirements for specific elements to include in the SPCC Plan are found in 40 CFR 112.7. Once your Plan is completed, a Registered Professional Engineer (PE) who is familiar with the SPCC requirements and has examined your facility must review and certify the Plan. Most importantly, you *must* fully implement the SPCC Plan. If your facility is newly constructed or recently modified, you *must* prepare or revise your SPCC Plan within six months.

[2]For the purposes of this guide, mines and quarries subject to the SPCC rule are "facilities."

Modifications may include, for example, changes in piping arrangements or tank installation or removal.

Pollution Prevention and Control Measures for Certain Bulk Storage Facilities

Be certain that your Plan addresses all of the applicable requirements for oil pollution prevention and control. Paragraphs (e)(1) through (e)(4) and (e)(8) through (e)(10) of 40 CFR 112.7 set out various spill prevention and control measures that should be addressed in your SPCC Plan for your mine or quarry.

General Requirements for Containment and Diversionary Structures (40 CFR 112.7[c])

All SPCC-regulated facilities, including mines and quarries, *must* have oil spill containment structures to prevent oil spills and contaminated runoff from reaching storm drains, streams (perennial or intermittent), ditches, rivers, bays, and other navigable waters.

You must install secondary containment and diversionary structures to contain oil-contaminated drainage (e.g., rainwater) or leaks from all tank battery and central treating plant installations. Section 112.7(c) lists dikes, berms, curbing, culverts, gutters, trenches, absorbent material, retention ponds, weirs, booms, and other barriers or equivalent preventive systems. Because SPCC requirements are performance-based, you may substitute alternative forms of spill containment if the substitute provides protection that is equivalent to systems listed in 40 CFR 112.7(c). A summary of secondary containment systems is provided at the end of this guide.

Generally, alternative containment systems may be appropriate for an aboveground storage tank (AST) system that has a capacity of less than 12,000 gallons. Alternative containment systems may be inappropriate for:

- Tank systems larger than 12,000 gallons; or
- Systems that consist of several tanks connected by manifolds or other piping arrangements that would permit a volume of oil greater than the capacity of one tank to be spilled as a result of a single system failure.

Whatever material or method you use for secondary containment, it *must* be sufficiently impervious to contain spilled oil.

Spill Prevention and Control Measures that Apply to Mines and Quarries (40 CFR 112.7[e][1] through [e][4] and [e][8] through [e][10])

Facility Drainage (40 CFR 112.7[e][1])

Diked Areas

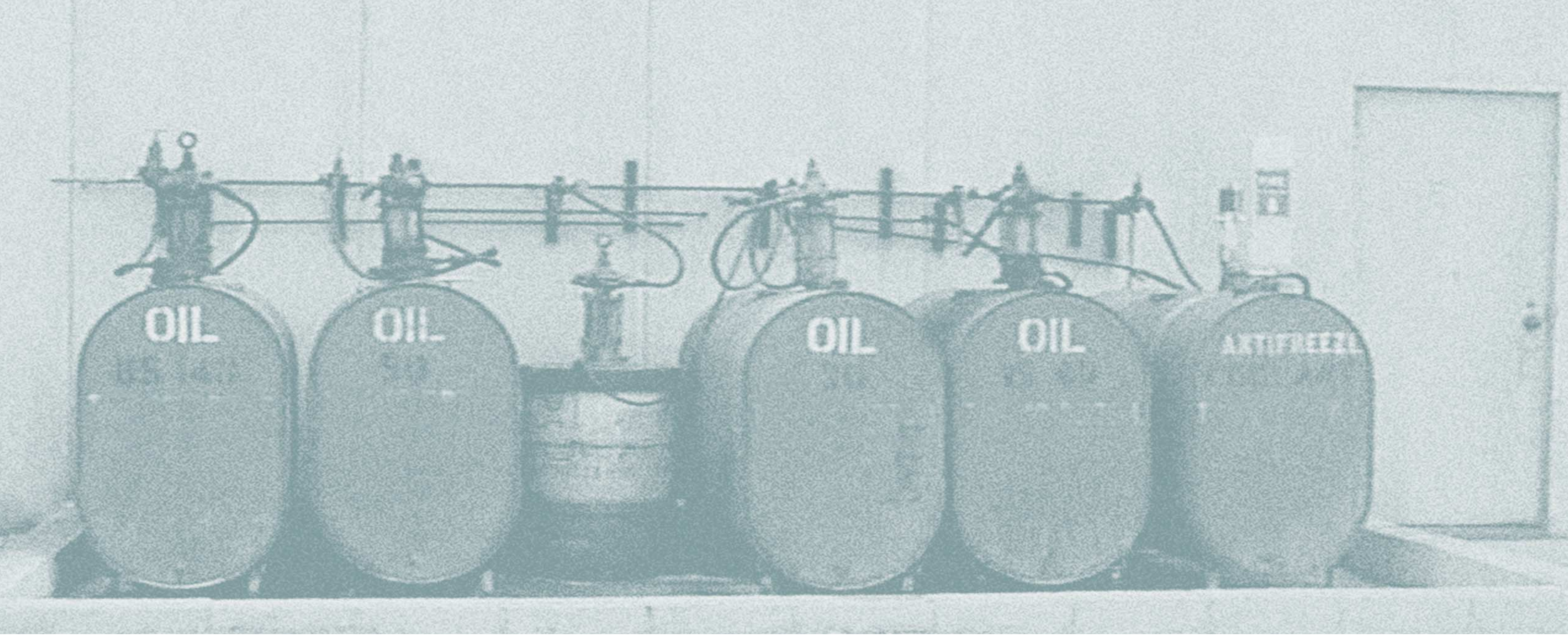
Dirt berms or retaining walls (e.g., a poured concrete wall) are commonly used as secondary containment for storage tanks. Curbing and catchment basins are commonly used as secondary containment for truck loading and unloading areas. These contained areas are "diked" areas, and water tends to accumulate around them. To drain accumulated stormwater from a diked area, install watertight drain lines through the dike walls. Because the drains at mines and quarries should be closed and sealed, except during rainwater drainage; fit these lines with valves or other means of closure that are normally sealed, closed, and locked. You *must* use open-close manual valves; flapper valves are unacceptable.

What are Navigable Waters of the U.S.?

Section 502(7) of the Clean Water Act, defines the navigable waters of the United States as the following:

- All navigable waters of the United States, as defined in judicial decisions prior to passage of the 1972 FWPCA (Pub. L. 92-500), and tributaries of such waters;
- Interstate waters;
- Intrastate lakes, rivers, and streams which are utilized by interstate travelers for recreational or other purposes; and
- Intrastate lakes, rivers, and streams from which fish or shellfish are taken and sold in interstate commerce.

The term navigable waters also includes the territorial seas, as defined in 40 CFR 110.1.



Be certain your Plan addresses drainage operations, including the following specific operations that must take place **before** anyone drains water:

- Visually inspect the diked areas to ensure that the water does not have an oil sheen and will not cause a harmful discharge;
- Opening, closing, and locking the bypass valve under responsible supervision following drainage; and
- Keeping adequate records of each drainage operation.

Be aware that chemical process solution spills can destroy the integrity of a concrete containment system. Therefore, promptly remove all spills

Note that a discharge is "harmful" if it will cause an oil sheen upon the water's surface or a sludge or emulsion deposit beneath the water's surface. Also keep an adequate record, recording information like the time, date, and employee who performed the operation. Any such record should be made part of, or referenced in, the SPCC Plan and kept for a minimum of three years. If you observe an oil sheen or any accumulated oil, you must use an alternate method for draining the diked area. For example, you may divert the contaminated water to an onsite treatment plant or oil-water separator. EPA determines the adequacy of these systems case-by-case, evaluating your adherence to good engineering practices and your ability to retain a spill if a system malfunctions.

There are many appropriate types and designs of drainage control systems (e.g., pumps and ejectors) and oil-water separators for vehicle service facility operations. Whatever you decide to use, make sure the design and operation is consistent with good engineering practices, based on the size and complexity of your facility's operations.

Undiked Areas

There may be no secondary containment system specifically designed for tank car and truck loading and unloading areas, truck or engine washdown areas, piping and manifold areas, garage bays, and fuel islands. These uncontained areas are "undiked" areas, and you should implement drainage control measures for them. A paved area improperly graded or a deteriorating curb may be the pathway through which contaminated water leaves your facility. Use a combination of curbing, trenches, catchment basins, and retention ponds to retain or reroute a spill. Inspect these structures to ensure their integrity and effectiveness.

To prevent mobile equipment spills [e.g., a broken hydraulic hose or fuel line] from contaminating your surrounding areas, design your facility to minimize the amount of stormwater flowing through the site. Use berms and trenches to prevent the water from entering your mine or quarry. Further, direct stormwater from roads and other travel ways into a containment area, such as a retention pond, to capture any mobile equipment spills.

General Requirements

If your drainage systems are not like the ones described above, equip all in-plant ditches with a diversion system that can return spilled oil to your facility. If you treat drainage waters in more than one treatment unit, use natural hydraulic flow. Where pump transfer is needed, provide two "lift" pumps. At least one of the pumps should be permanently installed when the treatment is continuous. Whatever techniques you use, make sure drainage systems are engineered to prevent accidental oil spills from reaching navigable waters.

Oil Storage: Bulk Storage Tanks, Portable Tanks, Drums, and Oil-Containing Equipment (40 CFR 112.7[e][2])

Oil storage containers or tanks used to store oil may be underground, partially underground, aboveground, and inside buildings.

Tank Material (e)(2)(i).

Do not use a tank to store oil unless the tank material and construction are suitable for this purpose and for the conditions of storage (e.g,. pressure, physical and chemical properties, and temperatures). One approach to ensuring good engineering practices is to apply industry standards to your tanks' construction, material, installation, and use. Refer to relevant portions of industry standards from organizations such as the American Petroleum Institute (API), National Fire Protection Association (NFPA), Underwriters Laboratory (UL), or American Society of Mechanical Engineers (ASME). State or local regulations (and some other federal regulations) may require that you use these standards. A summary of commonly used industry standards is included at the end of this guide.

Secondary Containment (e)(2)(ii).

Remember that any bulk storage container (e.g., tanks, oil-water separators) must have secondary containment for the entire contents of the largest single container with sufficient freeboard to allow for precipitation; or an alternate system like the ones listed in 40 CFR 112.7(c)(1). See *Facility Drainage (40 CFR 112.7[e][1]), Diked Areas,* discussed above.

The volume of freeboard should be sufficient to contain the rainfall from a 100 year, 24-hour storm event. If your facility is located in a state with large amounts of rainfall, your secondary containment structures should accommodate these greater amounts of water. The containment structure, including the bottom, must be sufficiently impervious to the types of oil products stored in the tank area.

Drainage (e)(2)(iii).

(See the guidelines for *Facility Drainage (40 CFR 112.7[e][1])* discussed above.)

Buried Storage Tanks (e)(2)(iv).

The advantages of using buried storage tanks, or underground storage tanks (USTs) are reduced vapor loss, increased safety, efficient land use, and greater security. The disadvantages are that leaks and corrosion in metal tanks may go undetected. Most facilities use fiberglass-reinforced plastic tanks to store petroleum products underground. Fiberglass tanks do not corrode. Metal surfaces corrode underground because of the electric current generated by the reaction between the metal surfaces and chemicals present in the soil and water. If you use a metal UST, use corrosion-resistant coating, cathodic protection, or any other effective method compatible with local soil conditions.

Partially Buried Storage Tanks (e)(2)(v).

EPA considers partially buried storage tanks as ASTs if ten percent or less of the volume of stored oil is underground. Under 40 CFR part 112, partially buried storage tanks are subject to the same requirements as other ASTs.

Avoid using partially buried metallic tanks for storing petroleum. If you must use this type of tank, make sure the buried section of the shell is adequately coated. The metallic surface of a partially buried tank in damp earth can rapidly corrode, so use protective corrosion-resistant coatings and cathodic protection.

Integrity Testing of Aboveground Storage Tanks (e)(2)(vi).

Periodically, a competent person should examine each AST for integrity. (Consider keeping

How Much Rain Can I Expect?

The National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC) provides precipitation data. The NCDC can be reached by telephone at (704) 271-4800 and at *http://www.ncdc.noaa.gov/ol/climate* on the worldwide web.

For More Information On Cathodic Protection Consult:

American Petroleum Institute (API) Recommended Practice 1632: *Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems*
(202) 682-8000

National Association of Corrosion Engineers (NACE) International Recommended Practice RP-0285-85: *Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems*
(713) 492-0535

NACE International Recommended Practice RP-0169-92: *Control and Corrosion on External Underground or Submerged Metallic Piping Systems*
(713) 492-0535

Steel Tank Institute (STI) R892-91: *Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems*
(202) 682-8000.

comparison records, where appropriate.) The worker may use techniques such as:

- X-ray or radiographic analysis to measure wall thickness and detect cracks and crevices in metal.
- Ultrasonic analysis to measure shell metal thickness.
- Hydrostatic testing to identify leaks caused by pressure.
- Visual inspection to detect cracks, leaks, or holes.
- Magnetic flux eddy current test used in conjunction with ultrasonic analysis to detect pitting.

Check the outside of the tank for signs of deterioration, leaks that might cause a spill, and accumulated oil inside diked areas. AST tank bottoms may be subject to extensive corrosion, which may go undetected during visual inspections. A tank also may fail due to surface corrosion. Pitting creates a high potential for AST failure. Holes may form in rusty tanks causing the tank to leak. Prevent corrosion by taking measures appropriate for the type of tank installation and foundation (e.g., dielectric coatings, carefully engineered cathodic protection, and double-bottom tanks).

Also, examine the foundation and supports for each tank. If a tank sits on a foundation, check for large gaps between the foundation and the tank bottom and for crumbling or excessive cracking in a concrete foundation. Assess whether a storage tank foundation provides adequate support for the tank. If the tank sits directly on the ground, check for large gaps between the ground surface and the tank bottom.

Document all leaks in an inspection form and report them to the person in charge of spill prevention at your facility. Repair leaks immediately! (In some cases, you may have to remove the product in the tank.)

Internal Heating Coils (e)(2)(vii).

Internal steam-heating coils are sometimes used in tanks containing heavy oils to keep the oil in a fluid, less viscous state in cold weather. These coils may corrode. When oil drains through a corroded coil, it may leak. To control for these leaks, monitor the steam return or exhaust lines for contamination from internal heating coils that discharge into an open water course. You can remove oil by routing the steam return or exhaust line to a settling tank, skimmer, or other separation system. If necessary, consider using external heating coils and insulating the sides of the tank. (Many owners and operators have moved from using problematic internal steam-heating coils to using more modern, external heat-exchanger systems.)

Fail-Safe Devices - Level Gauging Systems and Alarms (e)(2)(viii).

You must take precautions to ensure that tanks are not overfilled. Use fail-safe systems (gauging and alarms) to prevent the tank from overfilling and to prevent damage to the tank. A summary of level gauging systems and alarms is provided at the end of this guide.

Select level gauging systems that are in accordance with good engineering practices. Some larger tanks may have gauges and high-level alarms as the fail-safe system. Do not just "stick" a tank with any device. Consider using a second overfill protection measure as a backup.

Plant Effluents (e)(2)(ix).

If you discharge plant effluent into navigable waters, frequently examine disposal facilities to detect possible system disturbances that could cause an oil spill.

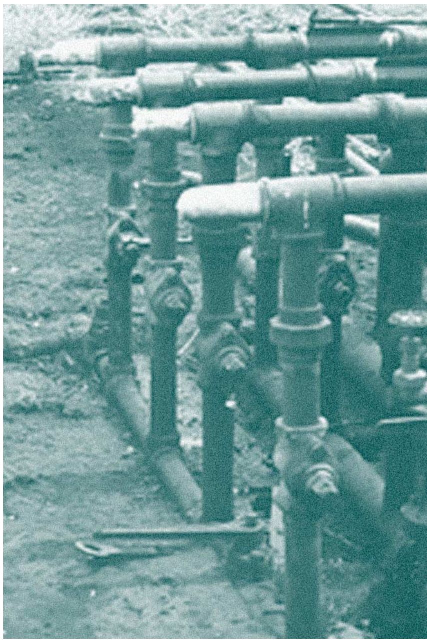
Oil Leaks (e)(2)(x).

You may find oil leaks from bolts, gaskets, rivets, seams, and other parts of the AST. Older riveted or bolted steel tanks tend to "weep" oil from rivets and bolts. Correct these leaks immediately.

Portable Oil Storage Containers (e)(2)(xi).

Position or locate mobile or portable oil storage tanks (including trucks containing product), 55-gallon drums, and other small containers to prevent spilled oil from reaching navigable waters. Remember that you should provide secondary containment (e.g., dikes, basins, or spill pallets) that can hold the contents of the largest container stored in the area. But you do not have to use expensive containment for drums and other small containers. If you have a small number of drums, purchase spill pallets or portable containment devices (e.g., overpack drums) designed for drum containment. You can find plastic troughs at feedstores that serve as an inexpensive alternative for large containers.

A good practice is to keep drums and portable oil tanks inside and covered in storage areas that are safe from periodic flooding or washout. A covered area reduces exposure to the elements, keeps containers in good condition, and eliminates runoff. At mines and quarries, portable oil storage tanks and drums are commonly used to transport oils to the job site. You should design these units to prevent spills. Be sure to protect valves and fittings from accidental damage. You should never have a fuel trucks fittings or valves vulnerable to the sides of passing trucks. Further, keep your forklift forks away from your tank or drum to prevent rupturing.



Transfer Operations: Hosing, Pipelines, and Joints (40 CFR 112.7[e][3])

Transfer operations equipment includes piping, valves, gauges, regulators, compressors, pumps, and other mechanical devices used to transfer oil from one place to another within a facility. Note that pipelines used to transport oil exclusively within the confines of a non-transportation-related facility are regulated under the SPCC program. Be certain that your Plan addresses procedures for transfer operations because there is a high risk of a spill during these operations. (Pipelines used to transport oil for interstate or intrastate commerce are transportation-related systems; the Department of Transportation's (DOT) Office of Pipeline Safety (OPS) program regulates these systems.)

Buried Piping (e)(3)(i).

You cannot visually examine buried piping, but you should periodically pressure test the pipes. If the piping material is metal, ensure that buried piping installations have a protective wrapping and coating. If metal pipes are in corrosive soil, apply cathodic protection, examine any section of exposed buried piping for deterioration and corrosion, and make any necessary repairs. (Plastic or fiberglass-reinforced pipes do not need protective coatings or cathodic protection.)

Cap, Blank-Flange, and Mark Pipes (e)(3)(ii).

Cap or blank-flange and mark the origin of the terminal connection at the transfer point of any pipeline that is out of service or in standby service for an extended time.

Proper Design and Spacing (e)(3)(iii).

Pipe supports should be designed and spaced to expand and contract, prevent sagging, and minimize abrasion and corrosion.

Inspections of Aboveground Pipes, Valves, and Pumps (e)(3)(iv).

Schedule and ensure regular examination of aboveground pipes, valves, pumps, gauges, flange joints, valve glands and bodies, supports, and metal surfaces. Periodically pack flow valves with grease, replace gaskets, rebuild pumps, and reseal connecting lines. Repair and replace any leaking or defective devices, and keep an adequate record of these repairs in your SPCC Plan for a minimum of three years.

Warning for Aboveground Pipes (e)(3)(v).

To ensure that large vehicle operations do not interfere with aboveground piping or hosing, warn drivers at your site of the presence of aboveground pipes in traffic areas. Tell them or post signs. Use appropriate protection in tank truck loading and unloading areas for aboveground pipes (e.g., bumper poles). Piping in high risk areas should be periodically pressure tested.

Tank Car and Tank Truck Loading and Unloading Procedures [40 CFR 112.7(e)(4)]

Product loading and unloading operations include putting fuel in a vehicle gas tank, and transferring oil to and from tank cars, tank trucks, or smaller carriers. Fueling terminals, islands, and other loading areas must meet the same requirements as the unloading areas of a facility.

Following DOT Procedures (e)(4)(i).

Regardless of the types of trucks servicing a facility, loading and unloading operations must follow DOT rules in 49 CFR parts 171, 173, 174, 177, and 179. Incorporate loading and unloading procedures in your standard operating procedures for product transfer. Consider ways to ensure that other commercial drivers or contractors at your site can implement these procedures (e.g., issue driver certifications).

EPA's Chemical Emergency Preparedness and Prevention Office has prepared an Alert titled *Lightning Hazard to Facilities Handling Flammable Substances.* For a copy, call (800) 424-9346 or (703) 412-9810.

Drainage and Containment (e)(4)(ii).

You *must* install some type of drainage and containment system for tank car and truck loading and unloading areas. The most common containment system for these areas is a covered, curbed, and graded area that drains to a sump. Make sure drainage flows into retention ponds, catchment basins, or treatment systems designed to retain oil or return it to the facility. If your rack area drainage does not flow into a catchment basin or treatment facility designed to handle spills, you must install a quick drainage system. Also consider methods to clean or retain oily stormwater or return it to your facility from loading and unloading areas. A system that incorporates good engineering practices minimizes the volume of water, ice, and snow that enters the containment area.

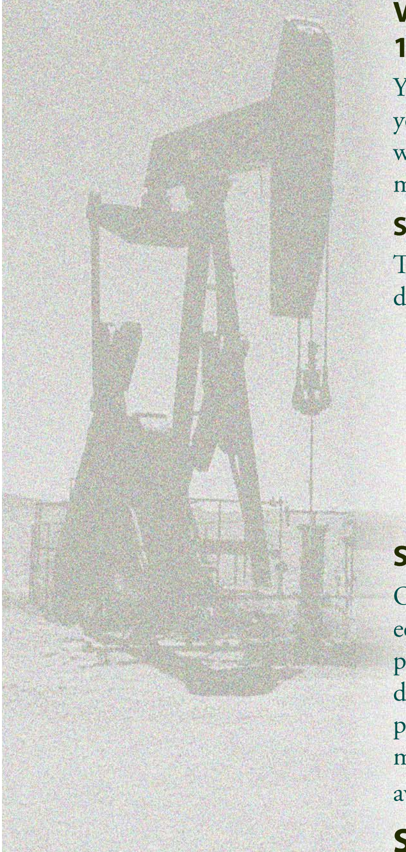
Whatever containment system you use, it must be designed to hold the maximum capacity of the largest compartment of a tank car or truck loaded or unloaded at your facility. For example, if a 9,000-gallon tanker truck has three 3,000-gallon compartments, the loading area containment should hold at least 3,000 gallons. If your facility has separate areas for different unloading or loading operations, design each area to hold the capacity of the largest carrier that operates in the area. If you load or unload from a "unit train," be sure the containment system can contain the aggregate volume of oil for all open railcars or compartments linked to a single manifold.

Warning or Barrier System (e)(4)(iii).

Provide an interlocked warning light, physical barrier system (such as a brake-interlock system for bottom-loading trucks), or warning signs in loading and unloading areas to prevent a vehicle from leaving before it is completely disconnected from the fuel transfer lines. You probably have large equipment at your facility; be sure to install barriers that are appropriate for the size of the equipment.

Vehicle Leaks (e)(4)(iv).

Before a tank car or truck is filled or leaves your facility, examine the vehicle's lowermost drain and all its outlets for leaks. If necessary, tighten, adjust, or replace valves to prevent leaking in transit.



Visual Inspection and Record-Keeping for Mines and Quarries (40 CFR 112.7[e][8])

You *must* ensure periodic visual inspection of tanks, separators, supports, and foundations. Keep records of your inspection and maintenance procedures, and note when workers drained diked areas. Keep these records with your SPCC Plan for at least three years. A summary of inspection and testing program record requirements is included at the end of this guide.

Security (40 CFR 112.7 [e][9])

The SPCC rule requires simple security measures that greatly reduce the risks of releases — whether accidental, deliberate (e.g., vandalism), or an act of nature (e.g., lightning). These measures may include the following:

- Protecting your facility with full fencing, good lighting, and locked or guarded gates.
- Installation of devices such as motion detectors and video cameras.
- Restricting access to your facility during nonbusiness hours.
- Locking starter controls for fuel pumps and any valves that will allow the direct outflow of product when they are not in use.
- Capping or blank-flanging loading and unloading connections and pipelines when they are not in use.

Spill Prevention Training Requirements (40 CFR 112.7[e][10]

Operator error is the cause of a large number of spills; therefore, train your staff to operate and maintain equipment properly. You *must* properly instruct drivers, tank gaugers, pumpers, and any other operating personnel involved in oil operation systems in the operation and maintenance of equipment to prevent oil discharges; and applicable pollution control laws, rules and regulations. Regularly hold safety and spill prevention briefings to discuss spill events, malfunctioning equipment, and recently developed precautionary measures. Make certain that all your employees are familiar with your SPCC Plan. Have a copy of the Plan available for employee use. You *must* designate one person accountable for spill prevention at the facility.

Some Final Advice about Facility Construction and Design

If you are about to build a new SPCC-regulated facility, consult industry associations that can help you with technical and engineering standards for the design and construction of tanks and pipelines; cathodic protection of tanks and pipelines; AST tank bottom liners; tank inspection, repair, alteration, and reconstruction; tank cleaning; and tank overfill protection. You can use these standards to identify good engineering practices and comply with the SPCC requirements.

Do FRP Requirements Also Apply to Me?

EPA estimates that there are about 435,000 SPCC-regulated facilities. Of that number, about 6,500 facilities also are subject to the FRP rule. Currently, few mines and quarries are subject to the FRP requirements because of their storage capacities. Do not assume, however, that you are not subject to the requirements. Read the rule to be certain and document your determination, as described below.

Your facility is subject to the FRP requirements under 40 CFR 112.20 and 112.21 and associated appendices if it is a high-risk facility that poses a threat of *substantial harm* to the environment. As outlined in 40 CFR 112.20(f)(1), a facility has the potential to cause substantial harm if:

- It transfers oil over water to or from vessels **and** has a total oil storage capacity, including both ASTs and USTs, greater than or equal to 42,000 gallons; or
- Its total oil storage capacity, including both ASTs and USTs, is greater than or equal to one million gallons, **and one of the following is true:**
  - The facility lacks secondary containment able to contain the capacity of the largest AST within each storage area plus freeboard to allow for precipitation;
  - The facility is located at a distance such that a discharge from the facility could cause injury to an environmentally sensitive area;
  - The facility is located at a distance such that a discharge from the facility would shut down a public drinking-water intake; or
  - The facility has had a reportable spill greater than or equal to 10,000 gallons within the last five years.

You *must* document the determination of substantial harm by completing the "Certification of the Applicability of the Substantial Harm Criteria Checklist," provided as Attachment C-II in Appendix C of 40 CFR part 112. Keep this certification with your facility's SPCC Plan.

Where Do I Go for More Information?

Compliance Assistance Guides

EPA's Compliance Assistance Guides are listed below. You can obtain these guides by contacting EPA Headquarters, any of the 10 EPA Regional Offices, or by visiting EPA's Oil Spill Program Website at **http://www.epa.gov/oilspill**.

Introduction and Background to the Oil Pollution Prevention Regulation

Who's Who: Federal Agency Roles and Responsibilities for Oil Spill Prevention and Response

What to Expect During an SPCC/FRP Inspection

Facility Response Planning

Sample SPCC Plan and Sample Containment Volume Calculations

SPCC Requirements and Oil Pollution Prevention Practices for Bulk Oil Storage Facilities

SPCC Requirements and Oil Pollution Prevention Practices for Oil Production and Oil Drilling/Workover Facilities

SPCC Requirements and Oil Pollution Prevention Practices for Farms and Ranches

SPCC Requirements and Oil Pollution Prevention Practices for Mines and Quarries

SPCC Requirements and Oil Pollution Prevention Practices for Vehicle Service Facilities

Spill Prevention Requirements for Facilities Conducting Large Volume Transfer Operations

Spill Prevention and Control for Marinas and Other Waterside Fueling Facilities

Oil Spill Notification, Response, and Recovery

Secondary Containment Systems

Type of System	Description
Poured Concrete Walls	Poured Concrete Walls are strong, fairly watertight, and resistant to petroleum penetration when designed and maintained according to good engineering practices. **Limitations:** - Conventional concrete may absorb petroleum; any spill left inside a containment area may eventually penetrate the concrete and could contaminate groundwater sources. Therefore, clean up spills inside diked areas as soon as possible. - The expansion and contraction of piping that runs through containment walls can create areas of weakness. - Grouting in expansion joints must be maintained to prevent weak points, which may allow petroleum penetration.
Containment Curbs	Containment curbs, which are similar to speed bumps, are often used where vehicles may be in the containment area. **Limitations:** - They fill up with rainwater more rapidly than higher containment areas and they may wear down as a result of vehicle crossings.
Containment Pits and Trenches	Pits or trenches are below grade containment structures that may be covered with metal grates and lined with concrete. **Limitations:** - Earthen structures could potentially contaminate groundwater unless constructed with appropriate materials. - Pits and trenches deteriorate quickly if not properly supported. - If the grates covering pits and trenches are not properly maintained, pits and trenches become a threat to pedestrians.
Earthen Berms	Earthen Berms containing clay or bentonite mixtures are commonly used at very large oil storage facilities. **Limitations:** - Earthen berms are subject to water and wind erosion and require frequent rebuilding. - Sandy soil does not effectively contain oil spills; groundwater contamination may result. Impervious liners of clay or synthetic membranes may be required to contain oil spills. - Vegetation inside bermed areas is a fire hazard. Vegetation also restricts the operator's ability to detect spills or defective equipment. Root systems of large plants (like trees or bushes) may degrade the berm and permit leaking.
Concrete Block Walls	Concrete block walls are common containment structures. **Limitations:** - Settling eventually separates or cracks the blocks and destroys the integrity of the wall. - Concrete blocks are porous; it is impossible to make a liquid-tight seal between mortared joints. - Because of the freeze-thaw expansion properties of water, water and ice penetrate and eventually break the blocks apart.

Level Gauging Systems and Alarms

Type of System	Description
Direct Sight Level Gauges	In the simplest system, the gauge is a small-diameter glass or plastic tube vertically attached to two tank shell openings. The level in the tube shows the liquid level in the tank. Another common sight level gauge is a float gauge. In this system, a float rides on top of the liquid in the tank, moving a marker that is attached to a cable or chain on the outside of the tank. The marker moves up or down with the product level in the tank.
Digital Computers or Telepulse	Telepulse is a simple and accurate system for remote supervision of storage tank liquid levels and temperatures. The unit consists of a transmitter and receiver to relay and receive tank temperature and liquid level readings. You can tie-in digital computers to display data at multiple locations. You can also use portable fill alarm systems while liquid cargoes are being transferred from a storage container into a transportation vehicle. Many variations of these systems are in use.
High Liquid Level Alarms	High liquid level alarms are usually tied into a float gauge or level gauging system. The alarms produce an audible or visual signal when the liquid level in the tank reaches a predetermined level. In older systems, the signal is a simple sound produced by air motion.
High Liquid Level Pump Cutoffs	In this system a fill-level alarm triggers a pump control to shut down the pump when a preset liquid level is reached. This system reduces the human failure possibility and is effectively stops tanks from overfilling.
Direct Audible and Code Signal Communication	In this system the tank gauger and pumping station communicate, usually through two-way radio, to determine tank liquid levels and the pumping rates to use to avoid overfilling tanks. Beware: spills can occur when tank gaugers or pumping stations misread an audible or code signal to start or stop pumping.
Additional Safety Features	Most petroleum storage tanks have safety and level control systems with relief valves and overflow lines. Pressure and vacuum relief valves will prevent tank damage but may result in a spill or discharge of liquid. You can send excess liquid into another tank through an overflow line. Vacuum vents prevent a tank from collapsing when liquid is pumped out of the tank.

Inspection and Testing Program Record Requirements

Equipment	Types of Records
Aboveground Storage Tanks and Piping	- Conduct regular visual inspections; and test tank integrity regularly. (e.g., shell thickness testing). - Conduct regular visual inspection of pipe supports, pipes, valves and pumps. - Periodically, pressure test high risk spill area piping. - Conduct regular visual inspection of storage tank flow valves, supports, and foundations. - Conduct regular visual inspection of storage tank level gauges and alarms; test the mechanical functions regularly.
Underground Storage Tanks and Piping	- Pressure test tanks and piping. - Monitor the liquid inventory for leaks.. - Test the cathodic protection system.
Dikes, Berms, Secondary Containment Systems	- Conduct regular visual inspection of containment dikes and berms. - Record all rainwater drainage from diked containment areas. - Record the date and time of each rainwater drainage; have the employee or manager who performed drainage sign the record. - Keep rainwater free of oil sheen.

Summary of Common Industry Standards

Underwriters Laboratory (UL) Standard 142 Steel Aboveground Tanks for Flammable and Combustible Liquids	Applies to steel atmospheric tanks intended for aboveground storage of noncorrosive, stable, flammable, and combustible liquids that have a specific gravity not exceeding that of water. Does not apply to API Standard 650, 12D, and 12F tanks.
National Fire Protection Association (NFPA) Code 30A Automotive and Marine Service Station Code, Chapters 1 and 2	Applies to automotive and marine service stations and to service stations located inside buildings (special enclosures). Does not apply to service stations that dispense liquefied petroleum gas, liquefied natural gas, or compressed natural gas as motor fuel.
National Fire Protection Association (NFPA) Code 30 Flammable and Combustible Liquids Code, Chapter Two	Applies to all flammable and combustible liquids, including waste liquids (except those that are solid at 100 degrees Fahrenheit or above and those that are liquefied gases or cryogenic). (Chapter 2, Tank Storage, applies to aboveground and indoor storage of liquids in fixed tanks and in portable tanks with storage capacities of more than 660 gallons.)
American Petroleum Institute (API) Standard 620 Design and Construction of Large, Welded, Low-Pressure Storage Tanks	Applies to large field-assembled storage tanks that have a single vertical axis of revolution; and contain petroleum intermediates, finished products, and other liquid products that the petroleum industry handles and stores.
API Standard 650 Welded Steel Tanks for Oil Storage	Applies to aboveground closed-top and open-top welded steel storage tanks that are vertical or cylindrical. Addresses material, design, fabrication, erection, and testing requirements for welded steel storage tanks of various sizes and capacities.
API Recommended Practice 651 Cathodic Protection of ASTs	Describes the corrosion problems characteristic in steel ASTs and associated piping systems, and provides a general description of the two methods used to provide cathodic protection.
API Recommended Practice 652 Lining AST Tank Bottoms	Describes the procedures for achieving effective corrosion control by applying tank bottom linings to existing and new ASTs .
API Standard 653 Tank Inspection, Repair, Alteration, and Reconstruction	Applies to carbon and low alloy steel tanks built to conform with API Standard 650 or 12C. Provides criteria for the maintenance, inspection, repair, alteration, relocation and reconstruction of welded or riveted, nonrefrigerated, atmospheric pressure ASTs after they have been placed in service.
API Recommended Practice 920 Prevention of Brittle Fracture	Describes pressure vessel toughness levels to prevent brittle fracture failure.
API Standard 2015 Safe Entry and Cleaning of Tank	Provides guidelines for safety practice development for planning, managing, and conducting work in atmospheric and low pressure storage tanks.
API Recommended Practice 2350 Overfill Protection for Petroleum Tanks	Provides guidelines for establishing operating procedures and selecting equipment to assist in overfill reduction.
API Standard 2610 Design, Construction, Operation and Maintenance and Inspection of Terminal and Tank Facilities	Compiles various standards, specifications, and recommended terminal and tank management practices developed by API and other entities.

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OIL POLLUTION PREVENTION
AND RESPONSE

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These Compliance guides were developed by the
EPA Region 9 Oil Program
San Francisco, California
with the assistance of ISSI, Inc.
under contract #G102-432-00